ARCH ELECTRONICS CORP.

VER : A_0 update : 2020.01.02

AC-DC ITE Switching Power Supply

ARF500U SERIES 500 Watts

KEY FEATURES

- Universal Input 90-264Vac
- 500 Watt with 30CFM Forced Air
- 450W with Conduction Cooling
- 330W with Natural Convection
- High Efficiency up to 92%
- Safety Approval to UL / IEC / EN 62368-1
- -30°C to +80°C Wide Range Operation Temperature
- Operating Altitude 5000M
- Active PFC Function
- I/O Isolation 4000VAC
- Built-in 12V/0.3A Auxiliary Output
- Standby 5V@1A with Fan, @0.4A without Fan
- 3-Year Product Warranty

(In Progress)

ELECTRICAL SPECIFICATIONS

All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Model No.			ARF500U-12S	ARF500U-24S	ARF500U-48S
Max Output Wattage (with 30CFM FAN) (W)			500 W		
Max Output Wattage (Conduction Cooling) (W)		(Note 6)	400 W (100 VAC) / 450 W (230 VAC)		
Max Output Wattage (Natural Convection) (W)			250 W (100 VAC) / 330 W (230 VAC)		
Input	Voltage	(Note 3)	90-264 VAC or 127-370 VDC		
	Frequency (Hz)		47-63 Hz		
	Current (Full load)		<6.3 A max. (115 VAC) / <3.15 A max. (230 VAC)		
	Inrush Current (<2ms) (Clod Start)		< 40 A max. (115 VAC) / < 80 A max. (230 VAC)		
	Power Factor (at 230 VAC)		PF>0.94 at Full Load		
Output	Voltage (V.DC.)		12V	24V	48V
	Voltage Adj Range (V.DC.)		±5% Output Voltage		
	Voltage Accuracy		±2%		
	Current (with 30CFM FAN) (A) (max.)		41.5	20.8	10.41
	Current (Conduction Cooling) (A) (max.)	at 100 VAC	33.3	16.6	8.33
		at 230 VAC	37.5	18.75	9.375
	Current (Natural Convection) (A) (max.)	at 100 VAC	20.83	10.42	5.21
		at 230 VAC	27.5	13.75	6.87
	Line Regulation (100-264 VAC)		±1%		
	Load Regulation (10-100%) (typ.)		±1%		
	Minimum Load		1%		
	Maximum Capacitive Load		5,000μF	2,500μF	1,250μF
	Ripple & Noise (typ.)	(Note 1)	160mV	240mV	480mV
	Efficiency (at 230VAC)		90.5%	91%	92%
	Hold-up Time (at 115 VAC)	(Note 2)	8 ms min.		
Protection	Over Power Protection		Auto recovery		
	Over Voltage Protection		Auto recovery		
	Overt Temperature Protection		Auto recovery		
	Short Circuit Protection		Protection level 1 (nominal)：Continuous, Auto recovery		
			Protection level 2 (instantaneous high current)：Latch		
Isolation	Input-Output	(Note 5)	4000VAC or 5656VDC		
	Input-PE	(Note 5)	2000VAC or 2828VDC		
	Output-PE	(Note 5)	1500VAC or 2121VDC		

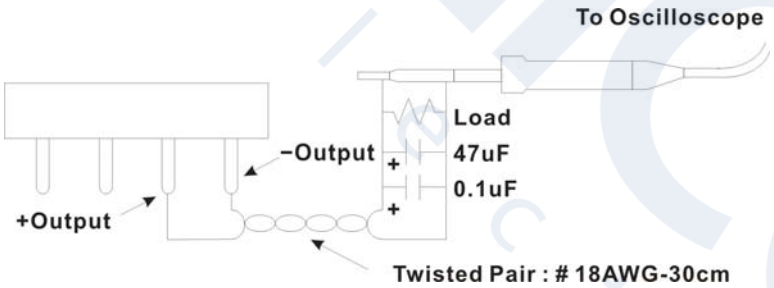
ELECTRICAL SPECIFICATIONS

All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Model No.		ARF500U-12S	ARF500U-24S	ARF500U-48S
Environment	Operating Temperature	-30°C…+80°C (with derating)		
	Storage Temperature	-30°C…+85°C		
	Temperature Coefficient	±0.03%/°C (0~50°C)		
		±0.06%/°C (-30~0°C)		
	Altitude During Operation	5000m		
	Humidity	95% RH		
	MTBF	>160,000 h @ 25°C (MIL-HDBK-217F)		
	Vibration	IEC60068-2-27 (10~500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes)		
	Shock	IEC60068-2-6		
Physical	Dimension (L x W x H)	5.11 x 3.25 x 1.6 Inches (129.7 x 82.55 x 40.6) Tolerance ±0.5 mm		
	Weight	In Progress		
	Cooling Method	Natural Convection / Conduction Cooling / 30CFM FAN		
Safety	Approval	UL / IEC / EN 62368 (In Progress)		
EMC	Conducted EMI	EN55032 Class B (In Progress)		
	Radiated EMI	EN55032 Class A (In Progress)		
	EMS	EN55035 (In Progress)		

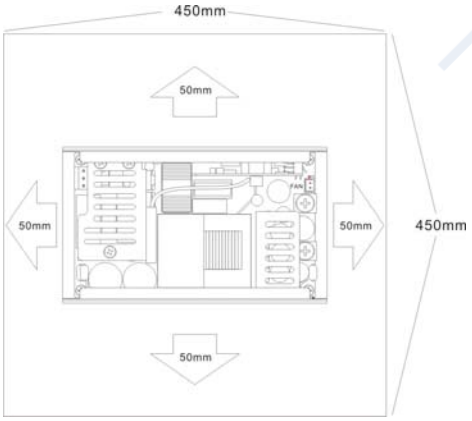
NOTE

1. Ripple & Noise are measured at 20MHz of bandwidth with ceramic 0.1uF & chemi-con KY 47uF parallel capacitor.



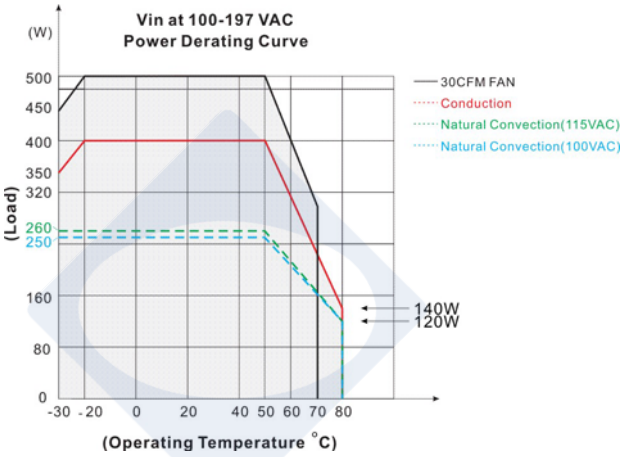
A 30cm twisted pair of no.18 AWG copper wire is connected to a 47uF and 0.1uF capacitor of proper polarity and voltage rating. The oscilloscope probe ground led should connect right to the ground ring of the probe and be as short as possible. The oscilloscope bandwidth should be at 20MHz and connected to AC ground.

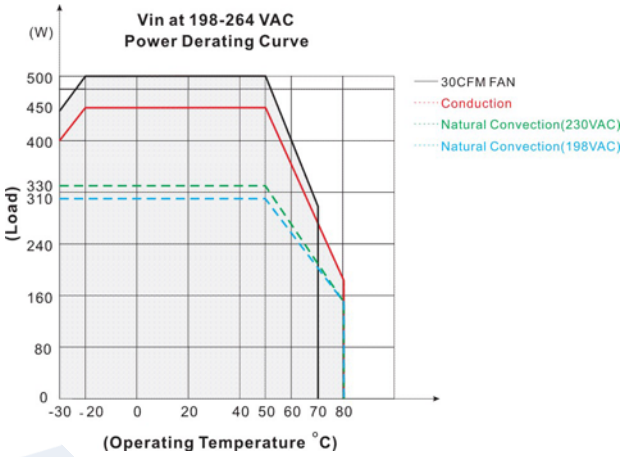
2. Hold-up Time measured at 90% Vout.
3. Please check the derating curve for more details.
4. Main Vout >3% Load, 12V (Aux) / 0.3A., 12V (Aux) need 0.1A Minimum Load, Auxiliary voltage output ground 10.2~13.3V
5. Strongly recommend to conduct this test with DC Voltage. If customer wishes to test with AC Voltage, please disconnect all Y-Capacitors within Arch power supply.
6. The size of the suggested aluminum plate is shown as below. And for optimizing thermal performance, the aluminum plate must have an even andsmooth surface (or coated with thermal grease), and ARF500 series must be firmly mounted at the center of the aluminum plate.
   450 x 450 x 3.0 mm



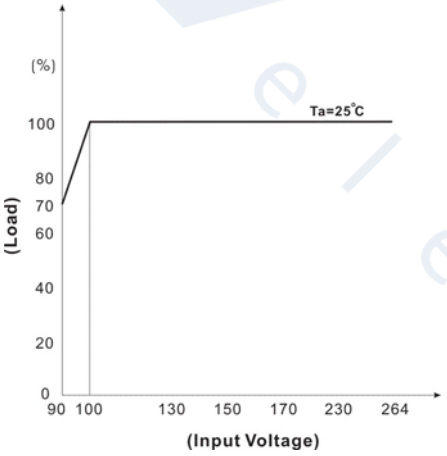
7. **CAUTION: Double pole, neutral fusing. Disconnect mains before servicing.**

DERATING



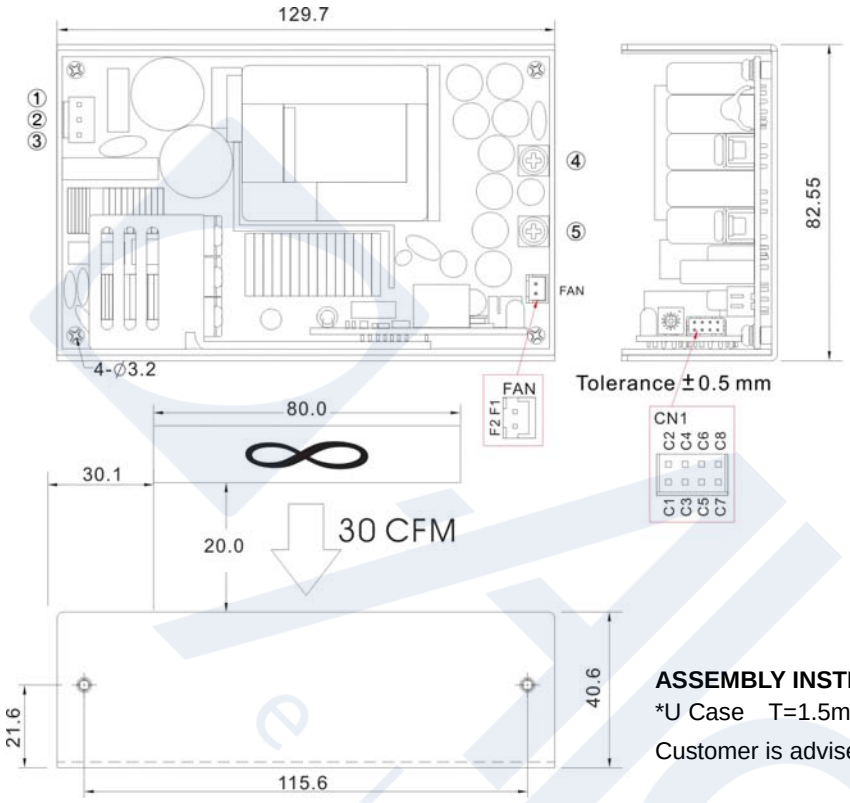


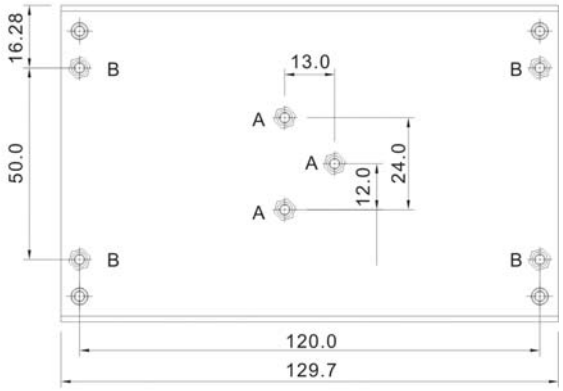
If input voltage is lower than 100VAC, please refer to the output derating V.S. input voltage curve for details



ARF500U SERIES 500 Watts

MECHANICAL DIMENSION (Top View)





A=Screw hole can only apply M3 x 4mm screws, and and limit to assemble with din rail clip only
A=M3x0.5P
B=For fixture to pcb/chassis only
B=M3x0.5P

ASSEMBLY INSTRUCTIONS

*U Case T=1.5mm

Customer is advised to screw into the threads no more than 2.5mm

PIN#	Single	Mating Housing	Terminal
A,B	PE		
AC Input Connector Pin : Alex 9397-3			
1	AC IN (N)	Alex 9396-3 or equivalent	Alex 96T Series or equivalent
2	NO PIN		
3	AC IN (L)		
DC Output Connector Pin			
4	+DC OUT	M5 Pan HD screw in 2 positions Torque to 8 lbs-in(90 cNm) max.	
5	-DC OUT		

Connector Pin (CN1) = Cherng Weei PHD2.0 - 2x4P			
PIN#	Single	Mating Housing	Terminal
C1	-5VSB	Cherng Weei PHD2.0 - 2x4P or equivalent	Cherng Weei PHD2.0 - 2x4P or equivalent
C2	+5VSB		
C3	GND		
C4	DC OK		
C5	-RC		
C6	+RC		
C7	-S		
C8	+S		

Connector Pin (FAN) = Cherng Weei CP-W20-02			
PIN#	Single	Mating Housing	Terminal
F1	+12V	Cherng Weei CP-H20-02 or equivalent	Cherng Weei CP-T20B or equivalent
F2	GND		

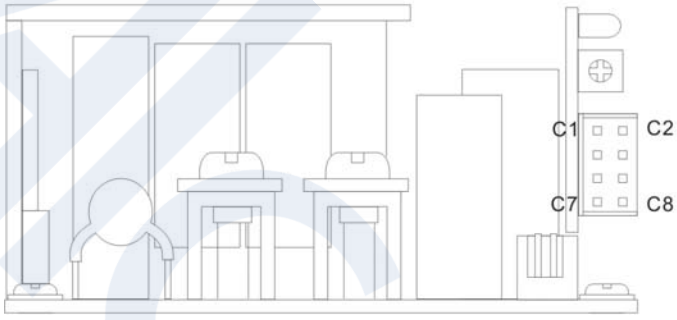
FUNCTION DESCRIPITON of CN1

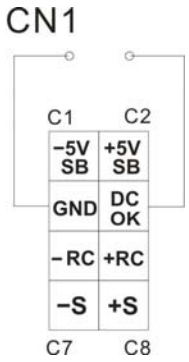
Pin No.	Function	Description
C1	-5VSB	This pin connects to the negative terminal(-V). Return for DC-OK and -RC signal output.
C2	+5VSB	Stand by voltage output ground 4.2~5.5V, referenced to pin C1(-5VSB). The maximum load current is 1A with Fan, 0.4A without Fan..
C3	GND	This pin connects to the negative terminal(-V). Return for DC-OK and -RC signal output.
C4	DC OK	DC-OK Signal is a DC output, referenced to pin C3(DC-OK GND).
C5	-RC	This pin connects to the negative terminal(-V). Return for DC-OK and -RC signal output.
C6	+RC	Turns the output on and off by electrical or dry contact between pin C5 (-RC), Short: Power OFF, Open: Power ON. The input voltage must be less than 1V in order to disable VOUT and greater than 3.3V (up to 5V) to enable it.
C7	-S	Negative sensing. The -S signal should be connected to the negative terminal of the load. The -S and +S leads should be twisted in pair to minimize noise pick-up effect.
C8	+S	Positive sensing. The +S signal should be connected to the positive terminal of the load. The +S and -S leads should be twisted in pair to minimize noise pick-up effect.

FUNCTION MANUAL & APPLICATION NOTE

1. DC-OK Signal

Between DC-OK and GND	Output Status
3.7~6V	ON
0~1V	OFF

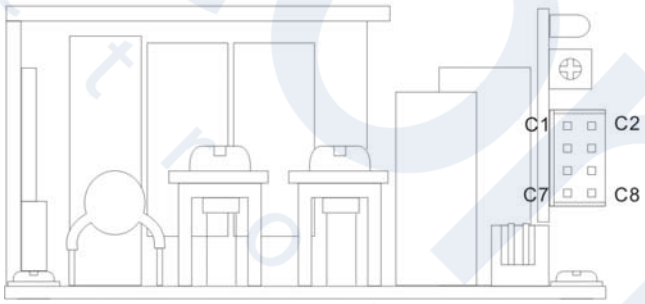


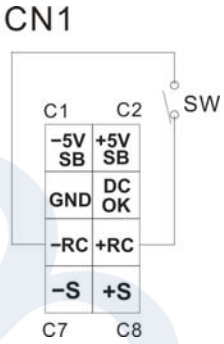


2. Remote Control

It can be turned ON/OFF by using the "Remote Control" function.

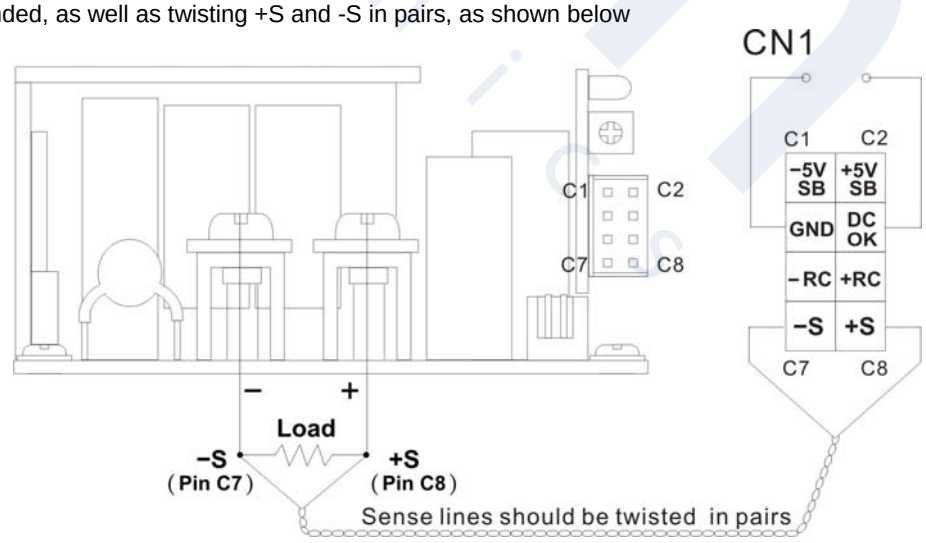
Between +RC and -RC	Output Status
SW ON (Short)	OFF
SW OFF (Open)	ON





2. +S and -S Sense

Shorter wiring to each unit is recommended, as well as twisting +S and -S in pairs, as shown below



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